

REMARKS

Claim Rejections 35 U.S.C. §103

Claims 1-8, 13-14, and 16-28 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Danielsen in view of Bickle.

In light of this rejection, claim 1 has been amended to clarify that identical copies of the input variables used by the processing units are obtained from a single buffer and distributed from that buffer to the processing units by the coordinator program. This limitation is in independent claim 17 but not explicitly stated in claim 1.

In light of this amendment, the rejection of claim 1 is respectfully traversed. As noted by the Examiner, Danielsen fails to explicitly disclose a buffer collecting asynchronous input variables from I/O circuits. More significantly, however, Danielsen fails to disclose a buffer configured to buffer the input variables to a single location and then provide them to the two processors at the same point to accommodate asynchronicity in the changes of the input variables. Generally, Danielsen fails to teach a practical method of coordinating two redundant processing units that, rather than monitoring a slowly varying single quantity such as wheel speed, must deal with possibly hundreds of inputs that change abruptly and discontinuously (such as binary inputs) that collectively define a state that can change extremely rapidly. Perhaps more fundamentally, Danielsen fails to teach how to coordinate two processors facing rapidly changing states without slowing the processors so much that real-time control can no longer be effected.

Bickle teaches a buffer, but not a buffer that provides a central clearinghouse for coordinating asynchronous data. There is no indication in Bickle that the buffers noted by the Examiner (elements 28 of Fig.2) are used for centralized coordination of input data to different processors (24). In contrast the use of different individually associated buffers for each processor clearly indicates that no such centralized collection and dissemination of input variables is intended. Further the buffers 28 would be understood to be memory caches of a type used to speed the access of data from memory, not to collect input data from real-time sensors per the present invention.

Perhaps equally important the three buffers in Bickle could not be replaced with a single clearinghouse buffer, because the three buffers in Bickle are required to detect errors caused by cosmic rays that typically affect only a single buffer. Column 1, lines 44-46 of Bickle indicates that errors in the caches (buffers) are the predominant source of faults. Thus

like Danielsen, Bickle fails to teach a buffer receiving a plurality of input variables asynchronously from I/O circuits connected to sensors and a coordinator program distributing identical copies of the input variables from that buffer to different processing units.

Claim 16 has been cancelled in the interest of expediting prosecution.

Claim 17 is believed to properly indicate that the input variables are collected in a buffer and identical copies of the accumulated input variables are provided from the buffer to the first and second processing units. Thus, for the same reasons described above, claim 17 is also believed to be allowable.

In light of these remarks and amendments, it is believed that claims 1 and 17 are allowable and therefore that claims 1-15 and 18-28, dependent on claims 1 or 17 are also now in condition for allowance and allowance of claims 1-15 and 17-28 is respectfully requested.

Very truly yours,

ANTHONY GERARD GBART, ET AL.

By: 

Keith M. Baxter
Reg. No. 31,233
Attorney for Applicant
Boyle Fredrickson Newholm Stein & Gratz, S.C.
250 East Wisconsin Avenue, Suite 1030
Milwaukee, WI 53202